5.2. Metrics and Accountability
(continued)

Every warehouse needs a trained associate to maintain the stock and to maintain the integrity of the material requirements planning (MRP) system that tracks inventory levels and re-order points. While great effort is typically paid to training technicians, formal inventory control training is usually non-existent, consisting of basic MRP software data entry with no warehouse or logistic training. With wind farm sizes varying dramatically, it is often not viable to have a dedicated inventory coordinator onsite. In either case, an employee with the aptitude and organizational skill needs to be identified and made accountable. Bar coding can be used to enter and relieve stock, for example. And with many scanning systems, the parts can be scanned and assigned directly to a work order. Ultimately, there needs to be one local associate assigned to guarantee the integrity of the part levels through daily or weekly cycle counting. A great resource to help setup inventory and logistic training is the American Production and Inventory Control Society, or APICS™. Their website offers learning resources and an industry certification to use as a benchmark.

6. Technician Continuous Improvement

In order to create a quality culture, it is important to ensure that technicians receive skills and knowledge regarding the use of data driven problem-solving. This could be analysis for special cause variation or the use of Six Sigma tools for common cause variation. In an ideal state, promotions to more advanced wind technician levels include the requirement to have the data driven problem-solving skill set in place. This includes both the academic and real world application of quality tools.

A format used for special cause variation analysis is the “Quality Improvement Story”. This is a seven step problem-solving process in which the team uses data to identify a project indicator and sets a target for improvement. A tie to the customer focus and company strategy is established, ensuring focus remains on the primary key objectives as defined by the customer. Project teams gather additional information, using tools like Pareto graphs, to further scope the problem. Then, they use an additional tool for analysis, such as the fishbone diagram, to brainstorm potential causes. The potential causes are verified through testing. The testing performed must identify the true root cause of the problem and any contributing factors.

6. Technician Continuous Improvement
(continued)

Countermeasures used to reduce or eliminate the root cause are identified through the use of a countermeasure matrix, which helps the user identify potential corrective actions, costs, and risks of implementation. Results are proven through plotting the post-countermeasure project indicator data and comparing against the initial target. The team then works to ensure that countermeasures are replicated across the site and across the applicable turbine technology in the standardization step. Remaining actions and the next project are identified in the future plans step.

Common cause variation is addressed through Six Sigma's “Define Measure Analyze Improve and Control” (DMAIC) methodology and is recommended for the wind operations management ranks. The technicians may be called in to participate in a measurement systems analysis or process mapping exercise.

6.1. Continuous Improvement Process for Technicians (Quality Belt Training)

All technicians are required to take quality training to reinforce the following concepts:

- Project charter
- “Supplier - Input - Process - Output - Customers” (SIPOC)
- Voice of customer
- Process map
- Data collection plan
- Indicators and metrics
- Graphs (line graphs, bar charts, and Pareto graphs)
- Brainstorming
- Affinity diagrams
- Cause and effect (fishbone diagrams)
- “5-Why” analysis
- “Non-Value Add / Value Add / Business Value Add” (NVA / VA / BVA) analysis
- Root cause verification
- Future state process map
- 5S (Sort, Set, Shine, Standardize, and Sustain) or 6S (Safety)
- Countermeasures matrix
- Pilot countermeasures
- Process control plans
- Visual process management
- Kanban (a visual signal used to trigger an action)
- “Poka Yoke” (mistake proofing)
- Standard work

6.2. Organizational Cultural Reinforcement

The company should provide opportunities for the technicians to compete at both the regional and corporate level with their completed quality projects. The quality projects must demonstrate measurable savings to the company and enable replication of countermeasures across the wind turbine technology. The competitions will help to share learnings from other projects and allow the technicians to develop relationships with other team members across the organization. The competitions should be held at an annual frequency and help to improve employee engagement in the area of quality.

6.3. Technician Ownership and Accountability

Technician accountability is established through the following two processes (note that participation in quality projects is expected for each rank):